

X. *A Monograph on the British species of Cyclas  
and Pisidium.*

BY THE REV. LEONARD JENYNS, M.A. F.L.S.

AND FELLOW OF THE CAMBRIDGE PHILOSOPHICAL SOCIETY.

[Read Nov. 28, 1831.]

THE genus *Cyclas* of Bruguiere was instituted for the reception of certain species of "Bivalve Mollusca" inhabiting fresh water, which were associated by the older Linnæan authors, either with *Cardium* or *Tellina*. Only three of these shells appear to have been distinctly known to Montagu as natives of this country, who referred them in his "Testacea Britannica" to the former of the two genera just mentioned. Other indigenous species have been discovered in later years, some of which have been described, and from time to time been made known to the public; nevertheless, from want of having their characters accurately defined, and still more from not being illustrated by figures sufficiently large to convey a correct idea of their relative proportions, it is not always very easy to identify them, nor to determine how far such species are really distinct from one another, or from those before known. It may be added also, that the synonyms have been much confused, and the same name has been applied in several instances to more than one species. It is on these grounds that I have been induced to draw up the following

paper. Having for many years paid considerable attention to this family, during which time I have not only increased the list of British species, but have also endeavoured to ascertain the extent of variation to which each of them is subject; having likewise been fortunate in obtaining authentic specimens of many of those alluded to by British authors, I thought that it might be rendering a service to the conchologists of this country, if I were to throw together, in the form of a monograph, the observations which I had made, and to draw up an amended list of all the species hitherto detected in this island, accompanied by full descriptions, and illustrated by magnified figures. In my attempt to do this, I have not merely considered the general characters of the shell, but in determining the species have derived much assistance from attending to the animal inhabitant. The species themselves are found in rivers, ditches, and streams; the smaller ones not unfrequently in the gullies that are cut in pastures for the purpose of draining the soil: they all however live readily in confinement for several days when kept in water; and under these circumstances their different habits may be conveniently observed. Occasionally it will be found that they become languid and inert, especially if they have been confined a long time; but they may generally be roused into activity by the sudden application of cold spring water, and this is by far the best method of getting a sight of the siphonal tubes, which in some cases afford good distinguishing characters. Indeed it is absolutely requisite to caution conchologists against drawing any conclusions with respect to the specific distinction of these animals from a mere inspection of the shell alone. This is so liable to vary from age, peculiarity of situation, and probably from other causes, that it becomes necessary in some cases to compare a

large number of specimens, collected from different sources, in order to determine the characters of a single species with any degree of precision. Occasionally the shell becomes exceedingly ventricose at the expense of its height, which is thereby considerably diminished; and the valves which perhaps naturally meet at an acute angle, under such circumstances meet at an obtuse one. This is particularly the case with one or two varieties hereafter to be described. Neither can sculpture be relied upon, the striæ varying exceedingly in number and distinctness according to the nature of the water in which the shell is found: a circumstance of which Dr Leach was not sufficiently aware when he formed three species out of *Pisidium annicum*. Age likewise produces great changes: not only are young shells much more compressed than adult ones, but in many instances the relative proportions of their parts are different. Indeed in the case of the minute species, so great and general a similarity prevails amongst their young, that it is hardly possible to identify them in this state without the closest examination.

After what has been stated, I need hardly add, how cautious I have been in characterizing the minuter species of this group, and that it is not till after repeated observations upon very extensive series of each, including many varieties from different localities, that I venture to bring forward the following list of such as are found in this country, as one which I trust will be found more complete than any which has appeared hitherto.

It will be observed, that with respect to the arrangement of these shells, I have deviated from that of Lamarck and most authors in referring them to two genera. This I have done in conformity with the views of Pfeiffer, who in his excellent work

on the land and fresh water Mollusca of Germany\*, first instituted the genus *Pisidium* for the reception of those species which are characterized by an inæquilateral shell, and a single siphon at the posterior extremity of the cloak. This distinction, founded upon the structure of the animal as well as that of the shell, appears to be perfectly natural; while there is little doubt that its utility will be soon acknowledged, when increased attention shall have been paid to this family, and future discovery have still further augmented the number of species, which we have every reason to expect will be the case. The propriety, however, of such a division of the old genus *Cyclas* will be best seen from the following comparative view of the characters of those adopted in this paper.

#### GEN. I. CYCLAS, *Lam. Pfeiff.*

*Animal*: Pallium anticè, pro pede exserendo, apertum, posticè conatum, et in tubum siphonalem longum, duplicem, contractilem, extensum. *Pes* linguiformis, valde extensilis.

*Testa* corticata, suborbicularis, subæquilateralis. *Dentes cardinales* minuti; in dextrâ valvulâ unicus plus minusve complex; in sinistrâ duo obliquè collocati. *Dentes laterales* longitudinales, compressi, lamelliformes, in valvulâ dextrâ subduplicati. *Ligamentum* externum, posticum, lateri longiori insitum.

#### GEN. II. PISIDIUM, *Pfeiff.*

*Animal*: Pallium anticè, pro pede exserendo, apertum, posticè conatum, et in tubum siphonalem brevem, simplicem, contractilem, extensum. *Pes* linguiformis, valde extensilis.

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\* *Systematische Anordnung und Beschreibung deutscher Land-und Wasser-Schnecken, &c. von Carl Pfeiffer. Cassel, 1821.*

*Testa* corticata, subovalis, inæquilateralis. *Dentes cardinales* minuti; in dextrâ valvulâ unicus plus minusve complex; in sinistrâ plerumque duo. *Dentes laterales* longitudinales, compressi, lamelliformes, in valvulâ dextrâ duplicati. *Ligamentum* externum, posticum, lateri breviori insitum.

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Although Pfeiffer has the merit of having first separated the above genera, his characters are not clearly defined, from the circumstance of his having confounded the anterior and posterior parts of the shell. The extremity from which the siphonal tube is protruded, and which strictly speaking is the posterior, he has termed differently in his descriptions of the two genera. I have adopted the views of Blainville with reference to this point, as well as in the selection of terms employed in characterizing the species, and accordingly it is to his "Manuel de Malacologie" that I must refer for an explanation of all such as occur in the following paper. The best characters for distinguishing the above genera are drawn from the structure of the siphonal tube, and the position of the hinge considered relatively to the two extremities of the shell. In the genus *Cyclas*, the tube is capable of protrusion to a considerable length, and although single at the base, is always divided at the apex, the upper portion, which is generally the shorter of the two, acting as the anus, while the lower, which is both longer and has a larger aperture, serves to conduct the water to the branchiæ. In *Pisidium*, this tube is single and undivided throughout its whole length, and although to a certain degree admitting of extension and contraction, is never protruded to the distance that it is in *Cyclas*. Indeed in both genera it appears to be quite a matter of pleasure whether it be exerted at all; the animal being often seen, both at rest and in motion,

with the tube either entirely concealed within the shell, or extended to its utmost limit. Another obvious distinction between these two genera, is afforded by the position of the hinge and cardinal teeth, with respect to the extremities of the shell. The teeth themselves are similar in the two instances, at least in general character; although subject to minute variation of form, more especially the cardinal tooth in the right valve, even amongst individuals of the same species; but the situation of the hinge is essentially different in *Cyclas* and *Pisidium*. In the former genus it is nearly central, the *posterior* portion of the shell being only to a slight degree longer than the anterior: in the latter, it is placed towards one end, and the *anterior* portion is obviously the longest; and although the excess of length in the first section of this genus is not very considerable, yet it will always be found in front of the hinge and not behind it. This will be made to appear more clearly by inspecting Plate XIX. in which Fig. 3. represents the hinge of *Cyclas calyculata*, and Fig. 4. that of *Pisidium amnicum*. In each case the right and left valves are distinguished by the letters *A* and *B* respectively, whilst *a* points out the relative position of the cardinal teeth.

Having made the above observations upon the generic distinctions afforded by these shells, I shall now proceed to characterize the species themselves in the order of their respective affinities.

#### GEN. I. CYCLAS.

##### Sp. 1. *C. rivicola*, Leach.

*C. testâ globoso-ovali, ventricosâ, striatâ; umbonibus obtusis; anticæ lunulâ flavâ impressâ; ligamento cardinali conspicuo.*

Long.  $10\frac{1}{2}$  lin. Alt.  $8\frac{1}{2}$  lin. Crass.  $6\frac{1}{2}$  lin.

*Cyclas rivicola*, *Leach MSS.*—*Lam. An. sans Vertèb.* 5. 558.—*Pfeiff. Land-und Wasserschu.* 121. t. 5. f. 3–5.—*Turt. Conchyl. Brit.* 248. t. 11. f. 13.—*Turt. Man. of Brit. Land and Freshw. Shells.* 12. f. 1.—*Flem. Brit. An.* 452.

*Tellina cornea* β, *Mat. and Rack. Linn. Trans.* 8. 59.—*Turt. Conch. Dict.* 180.

*Cyclas cornea*, *Draparn. Hist. des Moll.* 128. t. 10. f. 1–3.—*Brard, Hist. des Coq.* 219. t. 8. f. 2. 3.

*Jun. C. æquata*, *Shepp. MSS. Brit. Mus.*

*Animal* mihi ignotum.

*Testa* globosa, subovalis, ventricosa, solidiuscula, eleganter et distinctè striata; fusco-virescens, fasciis 2—3 saturatoribus, margine basali luteo; intus cærulescens: umbones tumidi, pallidiores, lineâ nigricante plerumque circumscripti: margo dorsalis anticè lunulâ, posticè fissurâ distinctè impressâ, utrâque flavescenti: ligamentum cardinale conspicuum.

This species is at once distinguished from the next, and from all the other British ones of this family by the superior size of the shell: the animal I have not seen. It appears to be confined to rivers, and is found I believe abundantly in the Thames, as well as in some other parts of the country. The largest specimens in my possession are from the Trent in Nottinghamshire. In its young state, it appears to be identical with the *C. æquata* of the Rev. R. Sheppard, according to specimens so named by that gentleman in the British Museum.

Sp. 2. *C. cornea*, Lamark.

*C. testâ* suborbiculari, globosâ, tenerrimè striatâ; umbonibus obtusis: ligamento cardinali inconspicuo.

Long.  $6\frac{1}{4}$  lin. Alt. 5. lin. Crass. 4 lin.

*Cyclas cornea*, *Lamarck*, 5. 558.—*Pfeiffer*, 120. t. 5. f. 1, 2.—*Nilsson*, *Hist. Mollusc. Suec.* 96.—*Turt. Conch. Brit.* 248. t. 11. f. 14.—*Turt. Man.* 13. f. 2.—*Fleming*, 452.

*Tellina cornea*, *Linn. Syst. Nat.* 1. 1120.—*Gmel.* 3241.—*Linn. Trans.* 8. 59.—*Dillw. Cat. of Shells*, 1. 104.—*Don. Brit. Shells*, t. 96.

*Tellina rivalis*, *Mull. Verm. Hist.* 2. 202.

*Cardium corneum*, *Mont. Test. Brit.* 86.

*Cyclas rivalis*, *Draparu.* 129. t. 10. f. 4, 5.—*Brard*, 222. t. 8. f. 4, 5.

*Var. β.*

Testâ subglobosâ, versus marginem basalem complanatâ; umbonibus tumidis, pellucidis, valdè prominentibus.

Long.  $5\frac{1}{2}$  lin. alt.  $4\frac{3}{4}$ . Crass.  $3\frac{1}{2}$  lin.

*Cyclas stagnicola*, *Leach MSS. Brit. Mus.*

*Tellina stagnicola*, *Sheppard, Linn. Trans.* 14. 150.

*Animal* album, viviparum: tubi siphonales subelongati, carneo pallidè colorati; superiore subconico, aperturâ parvâ apice perforato; inferiore cylindraceo, truncato, aperturâ ampliori: pes testam longitudine paulò superans.

*Testa* globosa, suborbicularis, ventricosa, tenuis, levissimè striata; nunc virescenti-fusca, zonis 1—3 lutescentibus, quarum 1 plerumque marginalis latior; nunc omninò fuscescens aut lutescens: umbones obtusi; in var.  $\beta$  valde prominuli, quasi inflati, pellucidi: lunula vix ulla: margo dorsalis posticè liturâ nigricanti duplici sæpe notatus: ligamentum cardinale inconspicuum.

This very common species is a general inhabitant of rivers, ponds, and ditches throughout the country, and appears to thrive equally well both in running and in stagnant water. In confinement it will oc-



asionally ascend the sides of the vessel in which it is kept, and during locomotion I have observed that the tubes are either partially exerted, or entirely concealed.

The variety  $\beta$  agrees with the series of specimens in the British Museum named by Dr Leach *C. stagnicola*. I am inclined to believe also that it is the same with the *Tellina stagnicola* of Mr Sheppard, as the remarks made by this latter gentleman with respect to the peculiar appearance of the *umbones*, apply very exactly; and it is particularly stated that he first received specimens from Dr Leach under the above name. Nevertheless I feel satisfied that it is a mere variety of *C. cornea*, as the animal is exactly the same in the two instances; and with regard to the peculiarity of the shell, many intermediate specimens may occasionally be met with. It is necessary, however, to mention, that the name of *stagnicola* appears to have been applied by Dr Leach at different times to two distinct species. The series of shells at present so named in the British Museum, are certainly the variety of *C. cornea* now under consideration; but I possess two specimens of a shell which came originally from Dr Leach, and which have the name of *stagnicola* under them in that gentleman's own handwriting, evidently belonging to the *C. calyculata* of Draparnaud, (Var.  $\gamma$ . of this paper,) and I am inclined to think that it was this latter shell which was formerly sent by the Doctor to Lamarek under the above name, and considered by that author to be a mere variety, not of *C. cornea*, but of the species last mentioned.

Other varieties of *C. cornea*, besides those above-mentioned, are not uncommon. Occasionally the shell exhibits gibbositics, and the margin becomes very obtuse: at other times the valves are much compressed, and their margins meet at an acute angle. In the fens of Cambridgeshire, a small variety is not unfrequent in the turf pits almost globular, and somewhat similar both in size and shape to a pea.

I may here observe that this, and all the other species of this family breed readily in confinement, during the spring and summer months. They are probably ovoviviparous; and the young appear to remain for a certain period within the folds of the branchiæ previous to their exclusion, since many may be found of different sizes within the parent at one and the same time. They have the faculty of producing long before they are arrived at their full growth, and even some individuals which are themselves so immature as to possess hardly any of the distinguishing characters of the species, frequently contain young of a sufficient size to be seen from without through the transparent valves.

In distinguishing this and the last species, authors have frequently drawn their essential characters from the presence and number of the longitudinal, or as they term them *transverse* grooves, indicative of the different stages of growth. But as these are very uncertain marks, depending upon age and other circumstances, I have not thought it necessary to notice them at all. The colour is not less variable.

Sp. 3. *C. calyculata*, Draparnaud.

*C. testâ* subrhombêâ, compressâ, tenui, albo-lutescenti, diaphanâ; natibus prominentibus, acutiuseulis, tuberculosis.

Long.  $5\frac{1}{2}$  lin. Alt.  $4\frac{1}{2}$  lin. Crass. vix 3 lin.

*Cyclas calyculata*, *Draparn.* 130. *t.* 10. *f.* 13, 14.—*Lamarck*, 5. 559.

*Pfeiffer*, 122. *t.* 5. *f.* 17, 18.—*Nilsson*, 99.—*Turt. Man.* 14. *f.* 3.

*Cardium lacustre*, *Montagu*, 89.

*Tellina lacustris*, *Linu. Trans.* 8. 60.—*Turt. Conch. Dict.* 180.

*Cyclas lacustris*, *Turt. Conchyl. Brit.* 249. *t.* 11. *f.* 18.

*Var. β.*—TAB. XIX. Fig. 1.

*Testâ* orbiculato-rhombêâ, minus compressâ, subdiaphanâ, fusco-rufescente.

Long.  $4\frac{1}{2}$  lin. Alt. 4 lin. Crass.  $2\frac{3}{4}$  lin.

*Cyclas lacustris*, Alder in *Trans. Nat. Hist. Soc. Newcastle*. 1. 40.  
*Brit. Mus. MSS.*

*Var. γ.*

Testâ orbiculato-rhombeâ, minus compressâ, subdiaphanâ, rufescente;  
natibus nigricantibus, minùs prominulis.

*Cyclas stagnicola*, Leach (*olim.*)

*C. calyculata*, (2), Lamarck, 5. 559.

*Animal* (in *Var. β*) album, tubis siphonalibus concoloribus; hi valde elongati, nunc superiore, nunc inferiore alium longitudine superante, quoad formam ferè ut in specie præcedenti.

*Testa* quam maximè variabilis, rhombea, orbiculato-rhombea, sub-ovalis, vel exactè orbicularis; plus minusve compressa, tenuis, diaphana, levissimè striata; plerumque cærulescenti-alba, zonâ marginali lutescente;—interdum fusco-rufescens, minus diaphana, apice nigricanti: nates acutiusculæ, tuberculosæ, in *a* et *β* prominentes, interdum etiam subinflexæ: ligamentum inconspicuum.

I feel satisfied that the above described shells are only varieties of one species, and all referable to the *C. calyculata* of Draparnaud. One of them is the *C. lacustris* of the British Museum, and also of Mr Alder, as I have been enabled to ascertain from specimens kindly forwarded to me by that gentleman. *Var. γ*, which only differs from the last in having the tubercles on the beaks not quite so prominent and well defined, I believe to be the variety, as I have already stated, originally sent to Lamarek by Dr Leach under the name of *C. stagnicola*. Mr Alder was of opinion that his shell was the *C. lacustris* of Draparnaud, but as Lamarek has referred the variety last mentioned (which differs so little from it) to the present species, and as he was acquainted with both the *C. calyculata* and *lacustris*, there can be little doubt that this last is distinct from either of the above.—Indeed I have never seen any British shell exactly answering to the *C. lacustris* of the continental

authors. Draparnaud appears to be the first who made a distinction between this shell and the *C. calyculata*, and this distinction has been since acknowledged not only by Lamarck, but also by Pfeiffer and Nilsson; but all the British specimens that have fallen under my observation with the name of *C. lacustris* attached to them, are in my opinion nothing more than mere varieties of the species under consideration.

As Muller has described only one of these two species, I consider it doubtful to which his description applies. I have therefore made no reference to his work in the present instance.

*C. calyculata* is much less abundant in this country than *C. cornua*. Montagu met with it in Devonshire and Wiltshire. Mr Alder finds it near Newcastle, but says that it is rare; and it has occurred sparingly to myself in two or three parts of Cambridgeshire.—Var.  $\beta$ , I observed last summer (1831) in considerable abundance in one pond on Bookham-Common in Surrey, and some which I kept by me alive for a few days, showed more activity than the last species, readily and frequently ascending the sides of the vessel, and walking, like *Physa Hydnorum*, on the under side of the surface of the water\*. Occasionally they remained in a quiescent state at the bottom with their posterior extremity elevated, and the siphonal tubes exerted to a considerable length, often nearly equalling that of the shell itself.—Var.  $\gamma$ . I have received from the North of England.

In young specimens the tubercle at the apex of each valve, so characteristic of this species, is *relatively* much larger than in the adult shell.

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\* This phraseology is not strictly correct, but is perhaps sufficiently intelligible. The action intended, consists in the animal extending its foot along the surface of the water with its shell immersed, and in an inverted position. In this manner, it contrives to traverse the vessel from side to side as though it were crawling along a solid plane.

## GEN. II. PISIDIUM.

\* *Testâ parùm inæquilaterali.*Sp. 1. *P. obtusale*, Pfeiffer.—TAB. XX. Fig. 1—3.

*P.* testâ globosâ, obliquè subovali, tenuissimè striatâ; umbonibus prominulis, obtusissimis.

Long.  $1\frac{3}{4}$  lin. Alt.  $1\frac{1}{2}$  lin. Crass. vix.  $1\frac{1}{2}$  lin.

*Pisidium obtusale*, Pfeiffer, 125. t. 5. f. 21, 22. — Brown in *Edinb. Journ. of Nat. and Geog. Scien.* 1. 413.

An *Cyclas obtusalis*? Lamarck, 5. 559.

*Pera gibba*, Leach, MSS. *Brit. Mus.*

*Var. β.*

Testâ ovato-trigonâ, ventricosissimâ, margine obtusissimo.

*Cyclas obtusalis*, Nilsson, 101.

*Animal* album; tubo siphonali abbreviato, subconico; pede valdè extensili, testâ dimidio et ultrà longiori.

*Testa* globoso-ovalis, ventricosissima, crassitudine ferè altitudinem æquanti, nitida, subtiliter striata; plerumque virescenti-nigra vel ochraceo-nigricans, zonâ marginali (junioribus latissimâ) lutescenti, interdum subaurantiâ; rariùs omnino lutescens: umbones tumidi, obtusè rotundati, paulò prominentes.

*Var. β.* gaudet testâ ventricosiori, margine basali obtusissimo, quò minuitur altitudo, et forma magis trigona vel ovato-trigona provenit. Hæc varietas plerumque nigricans, ochraceo plus minusve fucata.

This species, which is distinguished from all its congeners by the extreme convexity of the shell, is certainly the *P. obtusale* of Pfeiffer, and probably the *Cyclas obtusalis* of Lamarck, but from the short de-

scription given by this last author, a little doubt attaches itself to the latter synonym.—The variety  $\beta$ , also accords exactly with the *Cyclas obtusalis* of Nilsson. Dr Leach called it *Pera gibba*, but I do not feel certain that all the specimens on the board so named in the British Museum are referable to this species.—It occurs not unfrequently in Cambridgeshire, inhabiting small splashy pools and other stagnant waters, and I have observed that it is often to be found in company with the *Physa Hypnorum* Drap. It is by far the most active and lively species that I am acquainted with, being always in motion, and residing less at the bottom than the rest of this family. It transports itself rapidly along the under side of the surface of the water, and appears to delight much in floating masses of confervæ and other weeds. Dr Leach's specimens came, I believe, from the neighbourhood of Battersea Fields; and I have myself also met with it in other parts of Surrey.

*Obs.*—The measurements of this species are usually much less than those above given.

Sp. 2. *P. pusillum*, Nobis.—TAB. XX. Fig. 4—6.

*P. testâ orbiculato-ovali, compressiusculâ, subtilissimè striatâ, vix inæquilaterali; umbonibus parùm prominulis.*

Long.  $1\frac{3}{4}$  lin. Alt.  $1\frac{1}{2}$  lin. Crass. 1 lin.

*Tellina pusilla, Turt. Conch. Dict. 167.*

*Cyclas pusilla, Turt. Conchyl. Brit. 251. t. 11. f. 16, 17.—Turt. Mau. 16. f. 7.*

— *fontinalis, Nilsson, 101.—Draparn. 130. t. 10. f. 8—11?*

— *gibba, Alder in Trans. Nat. Hist. Soc. Newcastle. 1. 41.*

*Euglesa Henslowiana, Leach MSS. Brit. Mus.*

*Var.  $\beta$ .*

*Umbonibus magis prominentibus.*

*Var. γ.*

Striis profundius incisis.

*Animal* album; tubo siphonali brevi, nunc cylindraceo, nunc subconico, margine integerrimo; pede testam longitudine paulò superante.

*Testa* variabilis, plerumque orbiculato-ovalis, interdum suboblonga margine dorsali recto, vix inæquilateralis; præcedenti multò magis compressa, marginibus acutis; sæpius extraneâ rubigine obtecta, quâ remotâ, apparent striæ subtilissimæ, non nisi oculo armato conspiciendæ; in var. *γ.* nitida, striis distinctis, profundius incisis: umbones subdepressi, parùm prominuli, interdum subacuti.

This species appears to be the *Cyclas pusilla* of Turton, whose description and figure in his "British Bivalves," apply with tolerable exactness. Specimens also of that shell which I received some time since from the Rev. R. T. Lowe, with the assurance that they were authentic specimens originally from Dr Turton himself, agree with mine in every essential particular, although more compressed, and with the *umbones* not quite so obtuse and prominent. Nevertheless, I am inclined to think that this name has been occasionally applied to more than one species, particularly to some of the varieties of *P. pulchellum* hereafter to be described, which I have received from one or two collectors as the shell above-mentioned. I likewise consider this species as synonymous with the *Cyclas fontinalis* of Nilsson, although I entertain some doubts as to its identity with the *C. fontinalis* of other continental authors. Draparnaud especially has comprised under this name two varieties differing so materially in size, as to render it hardly probable that they belong to the same species.

*Pisidium pusillum* is distinguished from *P. obtusale* by the shell being much more compressed than in that species, and by the margins of the valves meeting at an acuter angle: the hinge is also nearly central.

the *anterior* extremity still being in a slight degree longer than the posterior. It is by no means of uncommon occurrence, residing chiefly at the bottoms of drains and ditches, where I have often found it buried at a considerable depth in the soft mud. It appears to be somewhat amphibious in its habits. Nilsson observes that it is often to be met with between the bark and the wood of decayed timber in wet places, and I have myself noticed that in confinement it will frequently leave the bottom of the vessel, and ascending the sides, take up its residence immediately above the edge of the water with its shell wholly exposed. It is a tranquil species, seldom moving much about, and never walking on the under side of the surface of the water. Where it occurs at all, it is generally in profusion.

Dr Leach appears to have raised this species to the rank of a distinct genus, under the name of *Euglesa*, but it hardly shows sufficient peculiarities to warrant this step. The shell is certainly somewhat intermediate in form between that of *Cyclas* and *Pisidium*.

Sp. 3. *P. nitidum*, Nobis.—TAB. XX. Fig. 7, 8.

*P. testâ* orbiculato-ovali, nitidissimâ, tenuiter striatâ; umbonibus obtusiusculis, striis paucis profundioribus.

Long.  $1\frac{1}{2}$  lin. Alt. vix  $1\frac{1}{2}$  lin. Crass. 1 lin.

*Animal* album; siphone brevi, infundibuliformi, aperturâ patulâ, plus minusve margine crenato, plicatulo.

*Testa* minimè variabilis, orbiculato-ovalis, parùm inæquilateralis; præcedenti paulò convexior, et pro ratione longitudinis altior; albo-lutescens, nitidissima, rarò aut nunquam sorde aut rubigine obtecta, tenuiter striata, striis hic illic, præcipuè 3—5 umbones transeuntibus, distinctiùs incis: umbones obtusiusculi, dorsalem marginem paulò superantes.



I can no where find any allusion to this species, which though similar to the two last in the general form of the shell, may at once be distinguished from both, if attention be paid to the animal. I have examined upwards of an hundred specimens from different localities, and in every instance it has preserved its characters. Its chief peculiarity consists in the formation of the siphonal tube, which is regularly funnel-shaped, with the aperture very patulous, somewhat plaited at the margin, and more or less crenate.—These appearances are not always obvious, unless the siphon is protruded by the animal to its utmost extent: the mouth of the tube, which is rendered very dilatable in consequence of the plaits, then becomes fully expanded, and the irregularity of its partially reflexed margin is rendered distinctly visible.—The shell also, which is subject to scarcely any variation, is remarkable for its extremely glossy hue and cleanly appearance, rarely presenting any of that foulness with which the last and following species are so often incrustated, although found inhabiting the same ditches; from which circumstance it would seem to follow, that in the case of those species, this is due to something more than a mere extraneous deposit from the surrounding soil. It may also be distinguished by a few peculiar striæ drawn with great regularity across the *umbones* near the apex of each valve, and cut rather more deeply than the rest. This character, however, will not be seen without a close examination. It is most visible when the animal is alive and the glossiness of the shell remains unimpaired; but even then it is sometimes necessary that this should be held to the light and turned in different directions, in order that the eye may catch the appearance in question. It is, however, more or less obvious in every specimen that I have seen.

This species is widely dispersed throughout Cambridgeshire, inhabiting various situations, though seemingly partial to clear water. It is however seldom found in any great plenty.—I have also met

with it in the ditches about Battersea Fields, and in other parts of Surrey.

\* \* *Testâ distinctè inæquilaterali.*

Sp. 4. *P. pulchellum*, Nobis.—TAB. XXI. Fig. 1—5.

*P.* testâ obliquè ovali, ventricosâ, profundius striatâ; umbonibus obtusiusculis, simplicibus.—Fig. 1.

Long. vix 2 lin. Alt.  $1\frac{1}{2}$  lin. Crass.  $1\frac{1}{4}$  lin.

*Var. β.*—Fig. 2, 3.

Plerumque minor, testâ tenuius striatâ; umbonibus subacutis.

Long.  $1\frac{3}{4}$  lin. Alt.  $1\frac{1}{4}$  lin. Crass. 1 lin.

Pera pulchella, *Leach MSS. in Brit. Mus.*

*Cyclas fontinalis*, *Brown in Edinb. Journ. of Nat. and Geog. Scien.* 1.

11. *Pl.* 1. *f.* 5—7.—*Alder in Trans. Nat. Hist. Soc. Newcastle.* 1. 41.

*Var. γ.*

Testâ obliquè ovali, tenuiter striatâ, compressâ, marginibus acutis.

Long.  $1\frac{1}{2}$  lin. Alt.  $1\frac{1}{4}$  lin. Crass.  $\frac{3}{4}$  lin.

*Var. δ.*—Fig. 4, 5.

Testâ suboblongâ, ventricosissimâ, profundius striatâ; margine obtusissimo.

Long.  $1\frac{1}{2}$  lin. Alt.  $1\frac{1}{4}$  lin. Crass.  $1\frac{1}{4}$  lin.

*Animal* album, siphone polymorpho; cylindræo, conico apice truncato, vel obconico; nunc abbreviato, nunc in tubum gracilem subelongatum (præcipuè in *Var. δ.*) extenso; margine hic illic inciso, vel integerrimo.

*Testa* quam maximè variabilis, in *α*, *β*, et *γ*, obliquè ovalis, distinctè inæquilateralis, nunc ventriosior, nunc compressiuscula, plus minusve profundè striata, nitida, cinereo-lutescens, interdum autem sorde ferru-

gineâ omninò incrustata: unbonnes simplices projecturâ nullâ, plerumque obtusiusculi.

*Var. δ.* suboblonga margine dorsali subrecto, minus inæquilateralis, ventricosissima, margine basali obtusissimo.

This species was originally discovered by Professor Henslow, and sent by him many years since to Dr Leach, who gave it the above name. I have since met with it in plenty throughout Cambridgeshire, and likewise in other parts of the county. In fact it is one of the most common species\*, inhabiting rivers, ditches, and likewise the smallest streams: it is rather active in its habits, frequently ascending the sides of the vessel in which it is confined, but I never observed it to walk along the under side of the surface of the water. The siphonal tube assumes a variety of appearances even in the same individual, and it is very interesting to watch, under a low power of the microscope, the striking and rapid changes of form through which it passes in a short time. It is altogether a variable species, and the shell is of a very different character in different situations; yet from the circumstance of my possessing many intermediate specimens, I feel confident that the above are only varieties.—*Var. δ.* is from a pond on Bookham-Common in Surrey; the others are all of frequent occurrence, and are often so much incrustated over with a kind of ferruginous earth as to be entirely concealed, and to present more the appearance of seeds or small lumps of dirt than that of shells. Whether this is the effect of soil and water, as seems to me more likely, or has any thing to do with the habits of the species, is not very obvious.

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\* The discovery of this and some other minute species, which though of frequent occurrence remained for a long time unnoticed by Conchologists, may be attributed to the use of a peculiar net invented by Professor Henslow about the year 1815. This instrument being constructed of the finest wire gauze enables the collector to strain the water more thoroughly than by any other method previously attempted: and thereby to separate the very smallest shells from the mud in which they are immersed.

There can scarcely be a doubt that this is the *minute shell* found by Montagu (*Test. Brit.* 88.) which he confounded with the young of *P. amnicum*. Mr Alder sent me a small variety of it from Newcastle as his *Cyclas fontinalis*, and I do not feel certain that it is not the *Pisidium fontinale* of Pfeiffer whose characters in some respects accord better with this species than with *P. pusillum* already described.

My largest specimens of this shell are from the neighbourhood of Battersea Fields.

Sp. 5. *P. Henslowianum*, Nobis.—TAB. XXI. Fig. 6, 7.

*P.* testâ obliquè ovali, ventricosâ, tenuiter striatâ; umbonibus subacutis, projecturâ lamelliformi adornatis.

Long.  $2\frac{1}{2}$  lin. Alt. 2 lin. Crass.  $1\frac{3}{4}$  lin.

Pera Henslowiana, *Leach (olim.)*

Tellina Henslowiana, *Shepp. in Linn. Trans.* 14. 150.

Pera appendiculata, *Leach MSS. in Brit. Mus.*

Cyclas appendiculata, *Turt. Man.* 15. f. 6.

*Animal* album, tubo siphonali brevi, quoad formam paulò variabili; plerumque subconico, apice truncato.

*Testa* obliquè ovalis, ventricosa, anticè planiuscula, distinctè inæquilateralis, tenuitèr striata, nitidè lutescenti-alba, vel cornea, sæpiùs partim præcipuè ad apicem, sorde ferrugineâ oblecta: umbonès acutiusculi, projecturâ parvâ lamelliformi adornatis.

*Obs.* In pullis projectura medio valvularum insidet; hinc gradatim assurgit, acrescente testâ.—(Vide Fig. 8, 9.)

The discovery of this very peculiar and well marked species is likewise due to Professor Henslow, who first found it in ditches communicating with the river Cam in the immediate neighbourhood of, and also a few miles below Cambridge. Dr Leach named it after him;

but subsequently changed the name to that of *Pera appendiculata*, reserving the above specific name for another and larger shell. This last having however since proved to be a mere variety of the following, I have restored the name of *Henslowianum* to the present species, which has indeed already been described under that title by the Rev. R. Sheppard in the Linnæan Transactions.—This shell is so strikingly distinguished by the curious eave-like projection upon the *umboes*, that it cannot be confounded with any other. In quite young specimens this projection is, as it were, a small wing arising from the middle of the valves, but as the growth of the shell proceeds, this last receiving its increase principally at the basal margin, it appears to mount higher up, until at length in adult individuals it occupies quite the summit of the shell, where it appears like a small ridge or lamina rising up vertically on either side of the hinge.—In other respects this species is very similar to the last; nevertheless it is always larger.—I have met with it in two or three parts of Cambridgeshire, but it does not appear to be of very general occurrence. Sheppard found it in Suffolk.

Sp. 6. *P. amnicum*, Nobis.—TAB. XIX. Fig. 2.

*P. testâ ovali, ventricosâ, profundius sulcato-striatâ; umbonibus obtusiusculis.*

Long.  $5\frac{1}{4}$  lin. Alt.  $3\frac{3}{4}$  lin. Crass.  $2\frac{3}{4}$  lin.

*Tellina amnica*, Muller, 2. 205.—Gmelin, 3242.—Linn. Trans. 8. 60.

*Dillwyn*, 1. 105.—Turt. Conch. Dict. 168.

——— *rivalis*, Maton, in Linn. Trans. 3. 44. t. 13. f. 37, 38.—Donovan, t. 64. f. 2.

*Cardium amnicum*, Montagu, 86.

*Cyclas palustris*, Draparnaud, 131. t. 10. f. 15, 16.

*Cyclas obliqua*, Lamarck, 5. 559.—Nilsson, 99.

*Pisidium obliquum*, *Pfeiffer*, 124. t. 5. f. 19, 20.

*Cyclas annica*, *Turt. Conchyl. Brit.* 250. t. 11. f. 15.—*Fleming*, 453.  
*Turt. Man.* 15. f. 5.

*Var. β.*

Sulcis profundius exaratis.

Pera fluviatilis, *Leach, MSS. in Brit. Mus.*

*Var. γ.*

Striis levius impressis.

Pera Henslowiana, *Leach, MSS. in Brit. Mus.*

*Animal* album, siphone paulò variabili; nunc abbreviato, subconico, apice obliquè truncato; nunc elongato, cylindraceo, apice plus minùsve recurvo.

*Testa* paulò variabilis, ovalis, vel obliquè trigona, distinctè inæquilateralis, ventricosa, anticè planiuscula, pulchrè striata hic et illic sulcis profundioribus; cinerascenti-fusca, maculis et zonâ marginali latâ pallidioribus, interdùm nitidè lutescentibus; rariùs omnino fuscescens aut lutescens; intus cærulescens: umbones obtusi, sorde ferrugineâ ut in præcedentibus sæpe incrustati.

This species, which was first published as British by Dr Maton l. c. is at once distinguished from all the others in this genus by its very superior size. It is not uncommon in rivers and gently running streams, residing wholly at the bottom, and being partially buried in the mud, but I have not often observed it in perfectly stagnant waters. Vars.  $\beta$  and  $\gamma$  were sent to Dr Leach by Professor Henslow from the neighbourhood of Cambridge. The former of these gentlemen considered them as distinct species, and they accordingly stand in the collection at the British Museum, under the above names; but I am perfectly satisfied that they are mere varieties, differing in nothing

but the depth and number of the longitudinal furrows and striæ, than which no characters can be more variable. The shell of this species, like that of the others belonging to this section, is frequently incrustated over with a kind of ferruginous earth, which prevails chiefly at the posterior extremity. Perhaps in the present instance this circumstance is connected with the habits of the animal; which usually having the anterior half of the shell fixed in the mud, the posterior and exposed portion receives all those finer particles of the soil which drifting downwards with the stream, are thereby deposited on its surface.—The young of this species are readily distinguished from the two last, by their more compressed shell, with the umbones scarcely at all prominent and the striæ more distinct.

The foregoing list includes all the British species belonging to the above genera which I have been able to identify satisfactorily. I possess one or two other shells which appear different from all hitherto described, but not having seen a sufficient number of specimens to judge of their true characters, I should not feel authorized in admitting them as really distinct.—I mention the circumstance, however, for the sake of exciting further enquiry upon the subject.

LEONARD JENYNS.

SWAFFHAM BULBECK,  
Nov. 14, 1831.